**UNIVERSITY OF GONDAR**
**COLLEGE OF MEDICINE AND HEALTH SCIENCES**
**DEPARTMENT OF ANAESTHESIA**

# Title of research project:

# Assessment of Knowledge and Attitude towards Enhanced Recovery after Surgery among health professionals in University of Gondar Hospital Northwest Ethiopia, 2017.

A PROPOSAL SUBMITTED TO THE DEPARTEMENT OF ANESTHESIA COLLEGE OF MEDICINE AND HEALTH SCIENCES, UNIVERSITY OF GONDAR IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE IN ADVANCED CINICAL ANESTHESIA

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## Background

Enhanced recovery after surgery (ERAS), first introduced in 2005, is a combination of various peri-operative patient care methods based on a multimodal approach that integrates evidence-based interventions to reduce surgical stress, maintain postoperative physiological function, and accelerates recovery in patients undergoing major surgery. The fundamental components of ERAS include patient education, no fasting, optimal fluid management, decreased tube use, no mechanical bowel preparation, opioid-sparing analgesia, and early mobilization. ERAS Society recommendations regarding peri-operative care in colorectal surgery are continuously updated as new information becomes available.

**Objective**: To assess the knowledge and attitude of enhanced recovery after surgery among anesthetists, surgeons, interns and nurses at University of Gondar Hospital.
**Methods**: A cross sectional study of knowledge, and attitudes regarding enhanced recovery after surgery among anesthetists, surgeons, interns and nurses were conducted in university of Gondar Hospital from May 1 to 20, 2017. Data were analyzed using SPSS windows version 20. Descriptive analyses, including means and standard deviations of continuous variables and frequencies and percentages of categorical variables, were calculated to describe the sample. Pearson's correlation, one-sample t-tests and analysis of variance (ANOVA) with Bonnferroni test were conducted to investigate the relationships among demographic variables and to answer the research question. *P*-values < 0.05 were considered to be statistically significant.
**Result**: Of 140 health workers, 112 were included in the study with a response rate of 80%. Anesthetists had a mean score of correct answer of 88.8% the questions followed by surgeons 66.8%, interns 60%, and nurses 55% ;and also 84.6% (22) Anesthetists were able to score above the mean score of 41out of 50 attitude scores followed by Surgeons (68.4%), Interns (46.2%) and Nurses (14.3%).
**Conclusions and Recommendations:** In this study anesthetists have better knowledge and attitude than other department staffs and Anesthesia post graduate program has a lot to do with this result. More or less, the overall results are encouraging and efforts should be made to give training regarding ERAS protocol.

## Introduction

### Statement of the problem

The fundamental components of ERAS include patient education, no fasting, optimal fluid management, no bowel preparation, decreased tube use, opioid-sparing analgesia, regional anesthesia, PONV prophylaxis, antibiotic before incision and thrombo-prophylaxis, and early mobilization and early feeding. All parts of the ERAS components play a great role in decreasing patient morbidity, mortality and length of hospital stay.

Prolonged fasting before and after surgery has traditionally been routine for surgical patients. This practice was combined with the administration of excessive fluids intra-operatively, and was originally intended to decrease the likelihood of aspiration, to combat dehydration, and to protect from complications such as renal failure. But 400ml of carbohydrate containing fluids can be administered to the patient 2- 3 hrs prior to surgery has shown to reduce preoperative hunger, thrust and anxiety. (1-3).

In the same manner, as one of the peri-operative protocolized tasks in the Japan, a study showed that shortening postoperative fasting is related with reduced length of postoperative hospital stay without adversely affecting morbidity, indicating that giving high caloric diet immediately on postoperative day 1 will prevent in tissue break down and fatigability(4).

The other component of the ERAS protocol is concerning fluids. Administering too much or less fluid may lead patient to different complications. The former may lead to bowel oedema and increased interstitial lung water, which can also lead to complications, and the latter can cause hypoperfusion of vital organs and the bowel, which can also result to complications(5, 6).

Mechanical bowel preparation prior to surgery has similarly been a routine practice in traditional surgical practice, but eliminating stool by means of cathartics has not been shown to change patient outcomes. There is no evidence that mechanical bowel preparation (MBP) decreases complications such as anastomotic leakage or wound infection. Even though some studies shown that patients receiving MBP have higher incidence of spillage of bowel contents and complications (7, 8), and also it is associated with side effects like dehydration, electrolyte disturbances and patient discomfort. Therefore its routine use is not recommended in colon and other major abdominal surgeries, except for rectal surgery (1-3, 9).

All intra-abdominal surgical procedures, even minimally invasive, are followed by a transient episode of gastrointestinal hypo- motility making postoperative illus (POI) a common clinical phenomenon after abdominal surgery. However, POI clearly has a significant impact on patient morbidity and results in a prolonged hospital stay and significantly contributes to annual healthcare costs. Implementation of fast-track colorectal surgical programs have already shown promising results in reducing overall hospital stay by epidural analgesia, earlier nutrition, and mobilization after surgery.(10)

Intraoperative components involve minimally invasive surgery, goal directed fluid therapy, regional anesthesia, PONV prophylaxis, antibiotic before incision and thromboprophylaxis. Postoperative components include early feeding and mobilization, optimum fluid and analgesic regimen, no NG or urinary catheter and multimodal analgesia with no opioid use as much as possible. Failure to implement those things mentioned above will directly or indirectly has a great impact on patient outcome.

## Literature review

A fast truck surgery (enhanced recovery after surgery), first introduced in2005, is an evidence-based peri-operative care protocol which aims at reducing the physiological and psychological stress of surgery that leads to faster functional recovery, reduced postoperative complication rate and is associated with earlier hospital discharge and reduced hospital costs.(9, 11, 12).

Fast truck surgery involves activities performed in the pre, intra, and post operative periods.

Preoperative components of an ERAS protocol involve patient counseling and education, preoperative evaluation and optimization, performing routine investigations, admission one day before surgery, oral carbohydrate loading, and techniques to minimize preoperative fasting, bowel preparation, fluid overload, invasive procedure and smoking cessation (4, 9, 11, 13).

Patient education is an important part of any ERAS program. The aim is to educate the patient about the program, to set practical expectations for post op recovery, and to psychologically prepare the patient and family members for the care program.(4)

An informed, prepared, physiologically optimized and well fed patient is the goal of preoperative patient education and counseling(4, 13).

The information can be provided to patients both verbally and in written form. But most of the time the information provided is verbal (11).
Written information at an appropriate literacy level should be provided, detailing explanation of the procedure along with goals for post op recovery, because detailed preoperative information given to patients can diminish fear and anxiety and facilitate post op recovery (4).

The information that should be included in patient education and counseling are, but not limited to: (4, 11, 13, 14)

- What will be done
- What to eat and drink
- What patients can do to enhance recovery
- How to wound care
- How to take medications and anti-pains

- Estimated time the recovery will take, and
- Addressing any concerns the patient could have.

The preoperative patient education and counseling can be performed by different group of health professional. In some institutions performed by nurses (13, 14), in others by anesthetists and surgeons (3, 15).

Preoperative evaluation and optimization aims to optimize and risk stratify patients: by which aiding with the consent process, choice of surgical procedure and anaesthetic techniques, and planning for appropriate postoperative location (4).

Preoperative evaluation will have additional importance on evaluation and optimization of chronic diseases like cardiovascular diseases, DM, anemia and the likes, help with smoking cessation and optimization of nutritional status (4, 14).

Cessation of cigarette smoking at least for one month before surgery reduces the risk of major pulmonary complications and the incidence of wound infection (4, 13).

Oral carbohydrate administration has shown to reduce preoperative hunger, thrust and anxiety. 400ml of carbohydrate containing fluids can be administered to the patient 2- 3 hrs prior to surgery (1-3).

No bowel preparation**:** there is no evidence that mechanical bowel preparation (MBP) decreases complications such as anastomotic leakage or wound infection. Actually some studies shown that patients receiving MBP have higher incidence of spillage of bowel contents and complications (7, 8).

Bowel preparation is associated with side effects like dehydration, electrolyte disturbances and patient discomfort. Therefore its routine use is not recommended in colon and other major abdominal surgeries, except for rectal surgery (1-3, 9).

Optimal fluid therapy: excessive (positive) preoperative fluid therapy is not recommended. 2500 ml fluid and 150 mmol sodium is the maximum recommended amount on the day of surgery (2, 15).

Prophylaxis against thromboembolism is the other element of intraoperative components of ERAS pathway. There are studies which recommend thromboembolism prophylaxis in the ERAS pathway; however most of them were studied on colorectal surgery. A recent meta-analysis recommends the use of both pharmacologic and non-pharmacologic thromboembolism prophylaxis(5).

In a Cochrane review on antibiotic prophylaxis in colorectal surgery(4), the authors concluded that the use of antibiotic prophylaxis for patients undergoing colorectal surgery is imperative to reduce the risk of surgical-site infections. For intravenous antibiotics, it is accepted that the best time for administration is 30–60 min before the incision is made(16).

There are no RCTs comparing general anaestthetic techniques for colorectal surgery. It makes good sense to use short-acting induction agents such as propofol combined with a short-acting opioid like fentanyl, alfentanil or a remifentanil infusion. Short-acting muscle relaxants can be titrated using neuromuscular monitoring.

Generally, a standard anaesthetic protocol allowing rapid awakening, low postoperative complications such as PONV and hemodynamic disturbance should be given. Peripheral nerve block, mid-thoracic epidural, spinal anaesthesia and low-dose opioids should be considered for open surgery (5).

Administering too much or less fluid may lead patient to different complications. The former may lead to bowel oedema and increased interstitial lung water, which can also lead to complications, and the latter can cause hypoperfusion of vital organs and the bowel, which can also result to complications. Fluid management for low risk patients undergoing low risk surgery, a zero balance approach might be sufficient, maintenance requirement can be delivered with a 1to 3ml/kg per hour of balanced crystalloid. However, for high risk patients and during major surgery using minimally invasive cardiac output monitors such as the esophageal Doppler (OD) device goal-directed fluid on an individualized basis by challenging the patient with a fluid bolus (e.g., 200 ml colloid) and seeing if there is an increase in stroke volume of C10 %. This fluid challenge is repeated every 10–15 min until there is no further increase in stroke volume. At this point, the stroke volume is ‘‘optimized’’ (5, 6).

A meta-analysis of the use of OD to target fluid therapy in major surgery has demonstrated short hospital stay, fewer complications, faster return of bowel function, reduced infection rates, less nausea and vomiting, a lower incidence of acute kidney injury, and the possible improvement of survival after surgery.

Additionally, intra-operative fluid requirement can be minimized by avoiding bowel preparation, maintaining hydration by giving oral preload up to 2 h before surgery, as well as minimizing

bowel handling and exteriorization of the bowel outside the abdominal cavity and avoiding blood loss.

As one of the peri-operative protocolized tasks in the Japan, a study showed that shortening postoperative fasting is related with reduced length of postoperative hospital stay without adversely affecting morbidity, indicating that giving high caloric diet immediately on postoperative day 1 will prevent in tissue break down and fatigability(4).

Although patients may develop abdominal distension or vomiting without a nasogastric tube, this is not associated with an increase in complications or length of stay. For every patient requiring insertion of a nasogastric tube in the postoperative period, at least 20 patients will not require nasogastric decompression. Routine nasogastric decompression is not supported by meta-analysis of the literature.

The increased risk to postoperative anastomosis leak fear for early start of feeding after bowel surgeries is well investigated. It concluded that the impact of early start of enteral feeding on increased risk of anastomosis leak is only unjustifiable and not evidence based practice in postoperative period(6).

**Routine postoperative mobilization care**

Even though there are a lot determinant factors that will enable the surgical patients for early postoperative mobilization, adequate pain relief should be ensured to fasten ambulation. It has been shown that early mobilization after adequate pain control helps the patient to mobilize and prevent venous thrombo-embolic complication.(16)

**Justification**

GUH is a referral hospital that provides service for more than 5 million people living in N/Gondar and surrounding areas. Many patients come to this hospital to undergo surgical procedures. Unfortunately many patients stay untreated and appointed for prolonged period on waiting list due to lack of beds. One of the main reason for this problem is patients will stay in the hospital after operation due to prolonged recovery time.

Evidence is continuing to emerge about the benefits of enhanced or rapid recovery, and many developed countries are incorporating it into their care. There are benefits to both patients and the health service as a whole from this approach.

ERAS protocols are aimed primarily at achieving early recovery, which leads to a shorter hospital stay without adversely affecting morbidity. Results from ERAS program and some studies suggest that postoperative complication and hospital stay are reduced. This is because patients receives evidence based care, have good postoperative cardiorespiratory and muscle function and early resumption of adequate oral intake of carbohydrate and proteins than the traditionally implementing program.
The relationship between health professionals and patients improves the experience of patients going through these pathways. This program also increased capacity of hospital service because patients are spent short time in the hospital, reducing waiting times, and reducing the number of staff required, which has directly financial benefits to the health system and to hospitals or the patients.
Multidisciplinary team working is the most important ERAS concept. Therefore, there are improved relationship between the team and hospital administrator and better multidisciplinary team within the hospital, which also improves patients care and working atmosphere.

The initiation of fast truck surgery will significantly reduce this problem and help many patients to get early treatment as it is proved by many studies to reduce hospital stay after surgery.

It also has very important role in decreasing postoperative complications and morbidity rate in patients. These effects in addition to reduced cost for the patient and hospital will make fast truck surgery the priority to be established at any cost.

Luckily establishing ERAS is very feasible for our hospital as it will not require extra cost, only dedicated multidisciplinary stuffs.

Several meta-analyses of randomized trials in colorectal surgery showed a decrease in length of hospital stay (LOS) with ERAS, compared with traditional care, without compromising patient safety. However, LOS as a surrogate measure of recovery has some issues, as it is influenced by a number of nonclinical factors that differ by country, including cultural and traditional background and insurance status. So doing this research will identify the knowledge, attitude and challenges to implement the program in our hospital.

## Objective of the Study

### General objective:

To assess the knowledge and attitude of enhanced recovery after surgery among anesthetists, surgeons, interns and nurses at University of Gondar Hospital 2017.

### Specific Objectives:

1. To assess the knowledge of anesthetists, nurses, surgeons and interns towards enhanced recovery after surgery.

2. To assess the attitudes of anesthetists, nurses, surgeons and interns towards enhanced recovery after surgery.

## Methods and materials

### Study Design

This was a cross sectional study of healthcare providers' knowledge, and attitudes regarding enhanced recovery after surgery. The healthcare providers are those working in the department of anesthesia and surgery in University of Gondar hospital and data will be obtained using an interviewer-administered questionnaire.

### Study subjects

All anesthetists, senior surgeons and all surgery residents ( $R_{1-4}$ ), all interns and nurses who were working in surgical wards at the University of Gondar Referral and Teaching Hospital during the study period were included in the study.

### Study tools

A structured questionnaire was developed that addressed socio-demographic variables, working department, status or qualifications, year of service, knowledge and attitude of participants about enhanced recovery after surgery.

### 3.4 Inclusive and exclusive criteria

#### 3.4.1. Inclusion criteria

All anesthetists, surgeons, interns and nurses working in Gondar university hospital during the study period were included.

#### 3.4.2 Exclusion criteria

Those professionals who were not willing to participate in the study.

Those professionals who were not present during data collection period.

**Sample size calculation and sampling technique**

All anesthetists, surgeons, surgery residents, interns and nurses working in all surgical wards who are available during the study period were included in the sample.

**Operational definitions**

**Good knowledge**: the study participants who answer above the mean of Knowledge questions are considered as having good knowledge.

**Poor knowledge**: the study participants who answer below the mean of the Knowledge questions are considered as having poor knowledge.

**Positive attitude**: the study participants who answer above the mean of attitude questions are considered as having positive attitude.

**Negative attitude**: the study participants who answer below the mean of the attitude questions are considered as having Negative attitude.

**Good practice**: the study participants who answer above the mean of practice questions are considered as having good practice.

**Poor practice**: the study participants who answer below the mean of practice questions are considered as having poor practice.

**Health professionals** – include surgeons, interns, anestiest and ward nurses in Gondar university hospital

## Ethical considerations

Ethical clearance was obtained from the institutional ethical review board of the University of Gondar. Written informed consent had been obtained from each study subject and confidentiality was ensured using an anonymous questionnaire**.**

**Data collection procedures**

We were distributing the questionnaires to the study participants of the respective departments after morning sessions or at any convenient time and place. An English version of the self-administered questionnaire was used to collect data from the participants, as the medium of instruction at the University of Gondar is English.

## Data Analysis

Data were analyzed using SPSS windows version 20. Descriptive analyses, including means and standard deviations of continuous variables and frequencies and percentages of categorical variables, were calculated to describe the sample. Pearson's correlation, one-sample t-tests and analysis of variance (ANOVA) with Bonnferroni test were conducted to investigate the relationships among demographic variables and to answer the research question. *P*-values <0.05 were considered to be statistically significant.

## Dissemination of Results

The results of the study will be presented to the department of anaesthesia as partial fulfillment of Msc in Advanced clinical Anaesthesia, annual research conference of the university, annual national conference of Ethiopian Anesthetists Association (EAA) and will also be sent as journal for publication. The results will also be disseminated to those who can advocate and implement them, for example Hospital Medical director office.

## Result

**Socio-demographic characteristics of the study participants**

Of the presumed 140 participants, only 120 were accessible and willing during the data collection period. Then 8 questionnaires were excluded for various permutations of incompleteness. Finally, a total of 112 health workers (26 anesthetists, 28 Nurses, 19 surgeons and 39 interns) participated in the study making a response rate of 80%.

Males accounted for Among 112 participants 72(64.3%) were males while 40(35.7%) were females. Of the 112 participants, 64.3% (n=72) were males. Majority of the participant's age from all departments were in the age category of 21-25(47.3%) years while 42% fall under the age category 26-30, 9.8% under the age category31-35, and only one respondent above 36. The average number of years of clinical experience amongst participants was 3.2 years (1-20).

As tabulated on table 3 below, a one way ANOVA test revealed that there was a statistically significant knowledge difference in the number of correct answers among departments (F, 50.106; p=0.00). There is also a statistically significant difference (p=0.06) between the age group 26-30 and 20-25 However, no statistically significant link of mean correct answer was observed for gender, marital status, religion and work experience.

**Table 1 - Age of respondents**

Data are (frequency and %)

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 20-25 | 53 | 47.3 | 47.3 | 47.3 |
| | 26-30 | 47 | 42.0 | 42.0 | 89.3 |
| | 31-35 | 12 | 10.7 | 10.7 | 100.0 |
| | Total | 112 | 100.0 | 100.0 | |

Table 2

**sex of respondent * educational level of respondents**

**Cross- tab**

| | | | educational level of respondants | | | | Total |
|---|---|---|---|---|---|---|---|
| | | | anesthetist | nurse | surgeon | intern | |
| sex of respondant | 1 | Count | 21 | 10 | 17 | 24 | 72 |
| | | % within sex of respondant | 29.2% | 13.9% | 23.6% | 33.3% | 100.0% |
| | | % within educational level of respondants | 80.8% | 35.7% | 89.5% | 61.5% | 64.3% |
| | 2 | Count | 5 | 18 | 2 | 15 | 40 |
| | | % within sex of respondant | 12.5% | 45.0% | 5.0% | 37.5% | 100.0% |
| | | % within educational level of respondants | 19.2% | 64.3% | 10.5% | 38.5% | 35.7% |
| Total | | Count | 26 | 28 | 19 | 39 | 112 |
| | | % within sex of respondant | 23.2% | 25.0% | 17.0% | 34.8% | 100.0% |
| | | % within educational level of respondants | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |

Table 3 Comparison of means across department

**ANOVA**

knowlgesum

| | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Between Groups | 525.131 | 3 | 175.044 | 50.106 | .000 |
| Within Groups | 377.297 | 108 | 3.493 | | |
| Total | 902.429 | 111 | | | |

ANOVA- analysis of variance.

**Knowledge towards ERAS Protocols.**

The total score and percentage score of each participant were computed. Each correctly answered question was scored as 1, and each incorrectly answered item was scored as 0. The total score was the sum of all questions' scores. The percentage score equaled the total score divided by 17 (the number of questions).

As shown on the above table, the overall correct item score ranged from 29.4% (5) to 100% (17) with an overall mean correct answer of 66.4%(11.3). This mean score demonstrated that students were able to correctly answer only 66.4% of the questions on average.

Anesthetists had a mean score of correct answer of 88.8% the questions followed by surgeons 66.8%, interns 60%, and nurses 55%.

Only 8(42.1%) surgeons, 9(23.1%) interns and 4(14.3%) Nurses correctly answer the type of procedures involved under ERAS program while 73.1% (19) Anesthetists was able to correctly answered it.

What do you think about the professions involved to implement ERAS protocol in your hospital was the second question and 21(75%) Nurses, 18(94.7%) Surgeons, and 36(92.3%) Interns were among those who correctly answer it while almost all anesthetists could answer it correctly.

The third question was on the components of the program or the activities performed under ERAS protocol. Almost all or 25(96.2%) Anesthetists, 20(71.4%) Nurses and 32(82.1%) Interns were among those who correctly answer the question while all the nineteen (100%) Surgeons gave the correct answer.

During open abdominal procedures, the rout of incision can be vertical or horizontal. The fourth question was to assess the health workers' knowledge regarding the preferred way for better post operative recovery after surgery. 73.1% (19) Anesthetists, 52.6% (10) Surgeons and 30.8% (12) Interns were able to answer it while 50% of Nurses could make it correctly.

Apart from the rout of incision during abdominal procedure, the techniques can be open or laparoscopic. Only 13(46.4%) Nurses, 7(36.8%) Surgeons, and 17(43.6%) Interns were among those who gave correct answer while the majority of the Anesthetists 23(88.5%) answered it correctly.

Among the preoperative activities given cover under ERAS protocol is Prophylactic antibiotics and 22(84.6%) Anesthetists, 27(96.4%) Nurses, 17(89.5%) Surgeons, and 37(94.9%) Interns were able to select the answer.

Out of 26 anesthetists, 25(96.2%) of them are equipped with the knowledge on how to select the preferred type of anesthesia given for the patient for better or enhanced recovery after surgery while 18(64.3%) Nurses, 15(78.9%) Surgeons, and only 4(21.1%) Interns were able to get the right choice. In addition to this, 24(92.3%) Anesthetists, 6(21.4%) Nurses, 5(26.3%) Surgeons, and 8(20.5%) Interns were among the participants who chose the preferred anesthetic agent with better post operative out come.

Pain management options were also the other big concern in ERAS protocol and 21(80.8%) Anesthetists were able to choose the right answer while only 4(14.3%) Nurses, 2(10.5%) Surgeons and 8(20.5%) Interns were able to do that correctly.

Eighteen (69.2%) anesthetists, 9(32.1%) Nurses, 6(31.6%) Surgeons and 12(30.8%) Interns could choose the correct answer for NPO time and the contents that the patient should take before operation.

Except one (3.8%) Anesthetist, all the others are well equipped with the knowledge for peri-operative fluid management options for surgical patients while 20(71.4%) nurses, 16(84.2%) Surgeons and 29(74.4%) Interns were able to choose the correct answer.

On average more than 92% of health workers from all departments were able to agree on the prevention of hypothermia as part of enhanced recovery after surgery and also almost all anesthetists agree the use of regional anesthesia to decrease length of hospital stay after surgery while 19(67.9%) Nurses, 16(84.2%) Surgeons and 28(71.8%) Interns agreed with this idea.

More than ninety six percent anesthetists, 14(50%) Nurses, 13(68.4%) Surgeons and 29(74.4%) Interns were among those who answered yes for the practice of minimally invasive or laparoscopic operations has less risk of post operative complications than using open approach for the same procedure.

Post operative delayed bowel motility or ileus is one of the complications which prolong length of hospital stay. 22(84.6%) Anesthetists, 9(32.1%) Nurses, 9(47.4%) Surgeons and 12(30.8%) Interns were able to choose the correct answers among those options to prevent post operative delayed bowel motility. In addition to this, advocating early post operative oral feeding and dietary supplementation also fasten recovery and 25(96.2%) Anesthetists, 10(35.7%) Nurses, 19(100%) Surgeons and 29(74.2%) Interns agreed with this protocol.

Table 4 knowledge assessment result based on department

Data are expressed in number and percentage

| S.NO | Items | Anesthetist | | Nurse | | Surgeon | | Intern | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Yes | NO | Yes | No | Yes | No | Yes | No | Yes(%) | No(%) |
| 1 | procedure | 19 | 7 | 4 | 24 | 8 | 11 | 9 | 30 | 40(35.7) | 72(64.3) |
| 2 | professions | 26 | 0 | 21 | 7 | 18 | 1 | 36 | 3 | 101(90.2) | 11(9.8) |
| 3 | component fast | 25 | 1 | 20 | 8 | 19 | 0 | 32 | 7 | 96(85.7) | 16(14.3) |
| 4 | incision | 19 | 7 | 14 | 14 | 10 | 9 | 12 | 27 | 55(49.1) | 57(50.9) |
| 5 | approach | 23 | 3 | 13 | 1 | 7 | 12 | 17 | 22 | 60(53.6) | 52(46.4) |
| 6 | antibiotics | 22 | 4 | 27 | 1 | 17 | 2 | 37 | 2 | 103(92) | 9(8) |
| 7 | Type ansthesia | 25 | 1 | 18 | 10 | 15 | 4 | 32 | 7 | 90(80.4) | 22(19.6) |
| 8 | Pain_ mgt | 21 | 5 | 4 | 24 | 2 | 17 | 8 | 31 | 35(31.2) | 77(68.8) |
| 9 | anesthetic | 24 | 2 | 6 | 22 | 5 | 14 | 8 | 31 | 43(38.4) | 69(61.6) |
| 10 | NPO | 18 | 8 | 9 | 19 | 6 | 13 | 12 | 27 | 43(40.2) | 67(59.8) |
| 11 | Fluid eras | 25 | 1 | 20 | 8 | 16 | 3 | 29 | 10 | 90(80.4) | 22(19.6) |
| 12 | ERAS_protocol | 22 | 4 | 27 | 1 | 17 | 2 | 34 | 5 | 100(89.3) | 92(7.1) |
| 13 | hypothermia | 25 | 1 | 26 | 2 | 19 | 0 | 34 | 5 | 104(92.9) | 8(7.1) |
| 14 | regional_ans | 26 | 0 | 19 | 9 | 16 | 3 | 28 | 11 | 89(79.5) | 23(20.5) |
| 15 | minimal_inva | 25 | 1 | 14 | 14 | 13 | 6 | 29 | 10 | 81(72.3) | 31(27.7) |
| 16 | bowel motility | 22 | 4 | 9 | 19 | 9 | 10 | 12 | 27 | 52(46.4) | 60(53.6) |
| 17 | oral feeding | 25 | 1 | 10 | 18 | 19 | 0 | 29 | 10 | 83(74.1) | 29(25.9) |
| | Total | 23.1 (88.8) | 2.9 (11.2) | 15.4 (55) | 12.6 (45) | 12.7 (66.8) | 6.3 (43.2) | 23.4 (60) | 15.6 (40) | 74.4 (66.4) | 37.6 (33.6) |

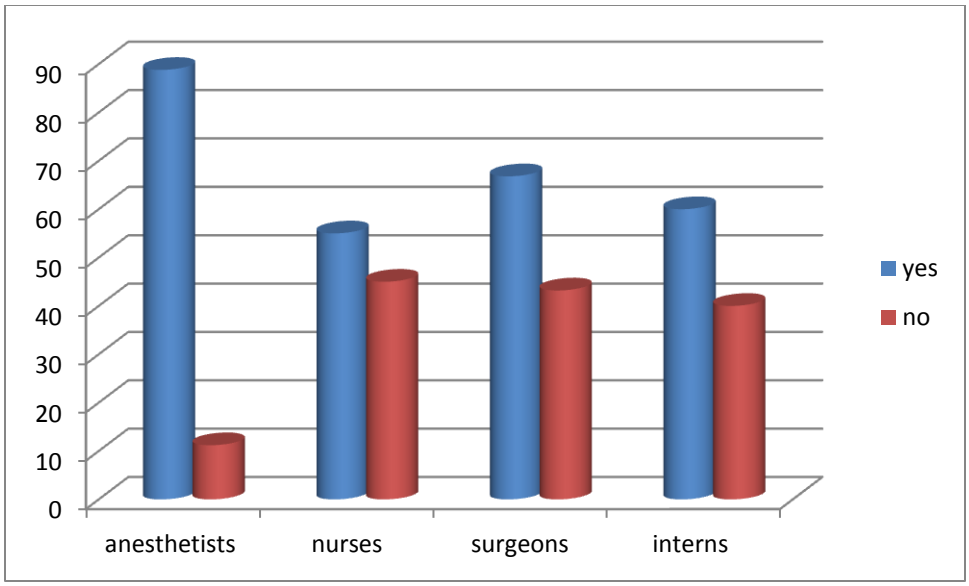


**Figure1. Knowledge assessment score among departments**

**Attitude towards ERAS protocols**

To assess the attitudes of the health worker, 10 questions were prepared with a sum total score of a minimum 10(strongly disagree) and a maximum 50(strongly agree) points. And then based on the participants answer, as shown on tab? They scored a minimum of 19/50 and a maximum of 50/50 with a mean score of 40.9 and 5.2 std. Deviation. For the purpose of analysis on spss, 1 is coded as values above the mean score (41) and 2 as values below the mean score (41). Based on this, 84.6% (22) Anesthetists were able to score above the mean score of 41 followed by Surgeons (68.4%), Interns (46.2%) and Nurses (14.3%).

Table 5 descriptive statistics of attitudes of

Sum- attitude

| | | |
|---|---|---|
| N | Valid | 112 |
| | Missing | 0 |
| Mean | | 40.5893 |
| Median | | 41.0000 |
| Mode | | 39.00[a] |
| Std. Deviation | | 5.15796 |
| Variance | | 26.605 |
| Range | | 31.00 |
| Minimum | | 19.00 |
| Maximum | | 50.00 |

## Discussion

This is the study of peri-operative care preferences by peri-operative staff working in university of Gondar hospital. Due to shortage of adequate literatures and references concerning knowledge and attitude towards ERAS protocol, the results of this study only indicate the knowledge and attitudes of respondents expressed in terms of mean and percentage. Apart from this, I haven't used any cut off points to compare the results of the respondents' knowledge and attitude with the standards. But I have tried to compare the results across departments using statistical methods.

**Table 6 Percent of each department's knowledge score out of 17 questions**

| Dept | Anesthetist | | Nurses | | Surgeons | | Interns | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Yes% | No% | Yes% | No% | Yes% | No% | Yes% | No% | Yes% | No% |
| Knowledge Sum | 88.8 | 11.2 | 55 | 45 | 66.8 | 43.2 | 60 | 40 | 66.4 | 33.6 |

This mean score demonstrated that students were able to correctly answer only 66.4% of the questions on average.

Anesthetists had a mean score of correct answer of 88.8% the questions followed by surgeons 66.8%, interns 60%, and nurses 55%. This means Anesthetists score majority of the questions on average followed by surgeons and Interns while Nurses only answer 55% of the questions and this could be anesthetist are more familiar and aware of ERAS protocols than other departments did. And these differences are also statically significant as stated in the table below.

**Table 7**

**Post Hoc Tests of ANOVA (Bonferroni) multiple comparisons of knowledge score of participants form all departments**

| (I) educational level of respondants | (J) educational level of respondants | Mean Difference (I-J) | Std. Error | Sig. |
|---|---|---|---|---|
| | nurse | 5.75549* | .50905 | .000 |
| anesthetist | surgeon | 3.70850* | .56412 | .000 |
| | intern | 4.84615* | .47323 | .000 |
| | anesthetist | -5.75549* | .50905 | .000 |
| nurse | surgeon | -2.04699* | .55555 | .002 |
| | intern | -.90934 | .46297 | .313 |
| | anesthetist | -3.70850* | .56412 | .000 |
| surgeon | nurse | 2.04699* | .55555 | .002 |
| | intern | 1.13765 | .52292 | .191 |
| | anesthetist | -4.84615* | .47323 | .000 |
| intern | nurse | .90934 | .46297 | .313 |
| | surgeon | -1.13765 | .52292 | .191 |

The mean difference is significant at the 0.05 level

The corrected Bonferroni post hoc analysis demonstrated that the statistically significant differences (p=0.00) were between Anesthetists vs. Nurses, Anesthetists vs. Surgeons, Anesthetists vs. Interns and between Surgeons vs. Nurses (0.002).

**Table 8 Number of respondents based on their score of attitude**

| Profession | Attitude | | |
|---|---|---|---|
| | 1 | 2 | Total |
| Anesthetists | 22(84.6%) | 4(15.4%) | 26 |
| Nurses | 4(14.3%) | 24(85.7%) | 28 |
| Surgeons | 13(68.4%) | 6(31.6%) | 19 |
| Interns | 18(46.2%) | 21(53.8%) | 39 |
| Total | 57(50.9%) | 55(49.1%) | 112<br>100% |

1: above the mean score of 41 out of 50

2: below the mean score of 41 out of 50

For the purpose of analysis on spss, 1 is coded as values above the mean score (41) and 2 as values below the mean score (41). Based on this, 84.6% (22) Anesthetists were able to score above the mean score of 41 followed by Surgeons (68.4%), Interns (46.2%) and Nurses (14.3%). From the above result, anesthetists and Surgeons have a better attitude than Nurses and Interns did and this difference is also statistically significant and explained with post hot test of ANOVA below.

**Table 9**

**Post Hoc Tests of ANOVA (Bonferroni) multiple comparisons of attitude score of participants form all departments**

| (I) educational level of respondants | (J) educational level of respondants | Mean Difference (I-J) | Std. Error | Sig. |
|---|---|---|---|---|
| anesthetist | nurse | 7.05495* | 1.22704 | .000 |
| | surgeon | 3.19028 | 1.35978 | .125 |
| | intern | 5.38462* | 1.14068 | .000 |
| nurse | anesthetist | -7.05495* | 1.22704 | .000 |
| | surgeon | -3.86466* | 1.33912 | .028 |
| | intern | -1.67033 | 1.11597 | .824 |
| surgeon | anesthetist | -3.19028 | 1.35978 | .125 |
| | nurse | 3.86466* | 1.33912 | .028 |
| | intern | 2.19433 | 1.26047 | .507 |
| intern | anesthetist | -5.38462* | 1.14068 | .000 |
| | nurse | 1.67033 | 1.11597 | .824 |
| | surgeon | -2.19433 | 1.26047 | .507 |

The mean difference is significant at the 0.05 level

As depicted on table 7: The corrected Bonferroni post hoc analysis demonstrated that the statistically significant knowledge differences (p=0.00) were between Anesthetists vs. Nurses, Anesthetists vs. Surgeons, Anesthetists vs. Interns and between Surgeons vs. Nurses (0.002).

And also depicted on table 9; the mean attitude score were significantly different among Anesthetists vs. Nurses, p=0.000; Anesthetists vs. Interns, p= 0.000 and Surgeons vs. Nurses, p= 0.028. This clearly shows anesthetists have better knowledge and attitude than others followed by surgeons. This might be due to their (anesthetist) frequent exposure and attend ERAS protocol session in their curriculum.

In the 2000s ERAS pathway in colorectal surgery were applied throughout Europe, and the 1st consensus guidelines were published in 2005. Since then ERAS pathways have been adopted worldwide, and path ways and guidelines have been published for major procedures because the principles apply to all patients undergoing major surgery.

But only 35.7% of the respondants were aware of this principle and this indicates how majority of the respondants were not aware of the principles of ERAS protocol.

The use of an epidural analgesia does produce better post operative pain control, a decrease in paralytic ileus, a decrease in respiratory complications and metabolic benefits when compared to parenteral opioids after colorectal surgery.

However, 68.8% of respondants fail to answer this question and this show the techniques of pain management options in UoGH OR and surgical wards was poor.

Generally, a standard anesthetic protocol and allowing rapid awakening, low postoperative complications such as PONV and hemodynamic disturbance (such as short acting opioids and induction agents like propofol) should be applied.

Though 92.3% of Anesthetists were able to select the appropriate options, only 31.2% of respondants were aware of these techniques as a whole and this shows little awareness about anesthetic protocols among surgeons, interns and nurses.

The concept of 'goal directed' fluid therapy have been shown to be advantageous over the more 'traditional' fluid therapy guidelines in that they significantly reduce overall morbidity and mortality.

In our study too, 90% of respondants agree with this idea and this showed fluid management has given more attention than other ERAS protocols.

Current preoperative fasting guide lines for adult patients undergoing elective surgery recommend a minimum fasting period of 2 hrs for clear liquids and 6 hours for a light meal. Preoperative 12.5% carbohydrate drink containing mainly maltodextrins has been shown to reduce pre-op hunger, thirst and anxiety.

But in our study only 40 % of the participants held this idea as correct and the traditional and routine way of keeping the patient NPO after mid night was the chosen as an answer by majority of the respondants.

A study done in Japan showed that shortening postoperative fasting is related with reduced length of postoperative hospital stay without adversely affecting morbidity, indicating that giving high caloric diet immediately on postoperative day 1 will prevent in tissue break down and fatigability and 74.1% of respondents in our study also agreed with this idea.

# Conclusion

In this study anesthetists have better knowledge and attitude than other department staffs and Anesthesia post graduate program has a lot to do with this result. More or less, the overall results are encouraging and efforts should be made to give training regarding ERAS protocol.

# Recommendations

These clinicians may be utilizing aspects of ERAS on a daily basis. For those who utilize formal ERAS programs, major difficulties can arise when introducing 'one fits all' clinical guidelines into routine practice. In fact, despite the advantages of formalized ERAS programs, their adaptation has been slow, with change of practice lagging behind evidence in the clinical setting where care tends to be driven by traditional and more conventional attitudes. Even after establishment of such a program, the compliance rate with various aspects of the ERAS protocols can also be a major obstacle. A protocol alone is not enough to implement multimodal recovery plans in peri-operative care. These programs require multidisciplinary group involvement, and a 'transition from the mindset of craftsman to that of an equivalent actor' needs to be taken by clinical staff caring for surgical patients.

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# Annex

University of Gondar, College of Medicine and Health Sciences

Department of Anesthesia

Questioner developed to assess Knowledge and Attitude towards Enhanced Recovery after Surgery among Health professionals who are working at Gondar University hospital.

Annex I: Consent form

Dear Physicians/Nurses/Anesthetists/Interns,

A questionnaire is prepared to assess knowledge and attitude regarding Enhanced Recovery after Surgery among health professionals who are working in Gondar University hospital.

**Introduction**: My name is Yohannes Alemneh. I am working with a research entitled; assess knowledge and attitude regarding ERAS protocols among Health professionals' who are working in Gondar University hospital. I have received permission from Department of Anesthesia at university of Gondar. The objective of this study is to determine staff health professionals' knowledge, attitude and practice towards ERAS protocol. You are randomly selected for the study because you are in the study group with the hope that you will cooperate with me. Therefore, I am requesting you to fill this questionnaire by yourself. There are no rights or wrong answers. There are no known risks associated with this research. You do not need to write your name that means your response will be anonymous and kept strictly confidential. This means your response will not be linked to your name or identity. Only the principal investigators and the research assistants collecting the data will have access to the data. You are kindly requested to answer every question and you may stop filling the form at any time you want to. However, your honest answers to these questions will help us for better understanding of staff's knowledge and attitude towards ERAS protocol in Gondar university hospital. We would greatly appreciate your help in responding to these questions. The survey will take about thirty minutes to fill this questionnaire. Would you be willing to participate.[put''x''mark]

Yes----------

No----------

Having been well explained and informed of the intentions and benefits of the study,

I voluntarily consent to participate in the study.

Respondent sign date

---------- ----------

Part I-

| S.N | Questions related to Socio demographic data | |
|---|---|---|
| 101 | Age | ----------Year |
| 102 | Sex | 1.Male<br>2.female |
| 103 | What is your religion | 1.orthodox Christian<br>2.Muslim<br>3.Protestant<br>4.Adventist<br>5.other specify---------- |
| 104 | What is your marital status | 1.Single<br>2.Married<br>3.Divorced<br>4. widow |

| | | |
|---|---|---|
| 105 | Ethnicity | 1.Amhara<br>2.tigray<br>3.Oromo<br>4.SNNP<br>5.other---------- |
| 106 | What is your work experience? | ----------year |
| 108 | What is your current level of education? | a) Anesthetist<br>b) Nurse<br>c) Intern<br>d) Surgeon |

Part II: **Questions related to knowledge about ERAS protocol**

| **S.N** | | |
|---|---|---|
| 201 | What patients are selected for fast track surgery? | a) Elective procedures<br>b) Emergency procedures<br>c) Day case surgeries<br>d) All types of procedures |
| 202 | Who do you think should involve in Enhanced Recovery after Surgery (ERAS) program? | a) The anesthetist<br>b) The surgeon<br>c) The intern<br>d) Nursing staff<br>e) Informed Patient attendant<br>f) Nutritionist (if any)<br>g) Physical therapist ( if any)<br>h) All in collaboration |

| | | |
|---|---|---|
| 203 | What are the components of fast track surgery? | a) Detailed preoperative evaluation & optimization of the patient<br>b) Adequate Intraoperative fluid & pain management<br>c) Post op follow up<br>d) The summation of all |
| 204 | During open surgery which approach do you think is preferable for fast tracking? | a) Vertical incision<br>b) Transverse incision |
| 205 | During abdominal surgery which approach do you think is preferable for fast tracking? | a) Open approach<br>b) Laparoscopic approach<br>c) Both has the same effect<br>d) Not my task |
| 206 | When do you think giving Prophylactic antibiotics has better effect? | a) 30-60 minute before the procedure<br>b) Immediately before skin incision<br>c) Immediately after surgery<br>d) Not important at all<br>e) Not my task |
| 207 | Which type of anesthetic technique is better for enhanced recovery after surgery | a) General anesthesia<br>b) Regional anesthesia<br>c) Both has the same effect<br>d) Not my task |
| 208 | Which pain management technique has fewer roles in fast track surgery after colorectal surgery? | a) Lower thoracic epidural analgesia<br>b) Plain abdominal field block<br>c) Non-opiate analgesic/NSAIDs<br>d) Strong opioids<br>e) Not my task |
| 209 | Which induction anesthetic drug do you think is recommended for fast track surgery? ( good choice ) | a) Ketamine<br>b) Propofol<br>c) Thiopental<br>d) Not my task |

| | | |
|---|---|---|
| 210 | Concerning NPO time, which one of the following is true | a) Loading carbohydrate fluids 2 hr prior to surgery is important<br>b) Patient should stay NPO for 6hr from solid foods<br>c) all<br>d) not my task |
| 211 | Regarding fluid management of surgical patient according to ERAS protocol | a) goal-directed fluid therapy enhance recovery after surgery<br>b) giving more fluids more than the calculated dose fasten post op recovery<br>c) fluids should be restricted to enhance recovery<br>d) not my task |
| 212 | Which one of the following is the component of ERAS protocol | a) pain management<br>b) fluid management<br>c) early removal of catheters and tubes<br>d) all |
| 213 | Do you think preventing hypothermia has role in enhancing recovery after surgery | a) Yes<br>b) No<br>c) Not my task |
| 214 | Do you believe that the use of regional anesthesia reduces length of hospital stay than general anesthesia? | a) Yes<br>b) No<br>c) Not my task |
| 215 | Do you think that the practice of minimally invasive operations or laparoscopic procedure has less risk of post operative complication than the same procedure performed in open fashion? | a) Yes<br>b) No<br>c) Not my task |
| 216 | Which of the following do you think is useful | a) Excessive fluid administrations |

| | | |
|---|---|---|
| | to prevent post operative delayed bowel motility or ileus | b) Use of long acting opioids<br>c) Post operative gum chewing<br>d) Not my task |
| 217 | Do you think that advocating early oral feeding and dietary supplementation fasten post operative recovery? | a) Yes<br>b) No<br>c) Not my task |

Part IV, questions related to attitude

| S.N | Questions | Strongly | | No | agree | Strongly |
|---|---|---|---|---|---|---|

| | | disagree | disagree | comment | | agree |
|---|---|---|---|---|---|---|
| 401 | Enhanced recovery after surgery protocol will improve patient out come | | | | | |
| 402 | Good communication and team working has great impact for better patient out come | | | | | |
| 403 | Preoperative patient counseling and optimization improve postoperative out comes and fasten recovery | | | | | |
| 404 | Mechanical bowel preparation for three days has greater advantage than using chemical ones in decreasing post operative complications | | | | | |
| 405 | Post operative gum chewing decrease the likelihood of developing ileus | | | | | |
| 406 | Managing pain on PRN base is not effective as using on regular daily dose. | | | | | |
| 407 | Goal directed fluid management has a better outcome for patient recovery than using the liberal or standard fluid management technique | | | | | |
| 408 | Full mobilization on the first postoperative day (getting out of bed, going to toilette, walking along the corridor) facilitate early recovery and discharge | | | | | |
| 409 | Avoiding use of naso-gastric tube and drains or early removal will fasten recovery | | | | | |
| **410** | Giving oral carbohydrate fluids 2-3 hrs before operation is beneficial for early recovery | | | | | |